INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FACULTY OF SCIENCE AND DATA ANALYTICS
DEPARTMENT OF STATISTICS
STATISTICS UNDERGRADUATE PROGRAM

Course	Course Name	:	**Matrices**
	Course Code	:	SS234102
	Credit	:	4 SKS
	Semester	:	I

COURSE DESCRIPTION

Matrices is one subject in the field of theory, which aims to master the basic concepts of mathematics to understand the theory of vectors, basic operations of matrices, determinants, inverses, random vectors, systems of linear equations, vector spaces, values and eigenvectors. Besides that, students able to use this concept for processing random variables, formulating modeling and calculating univariate and multivariate calculations. To achieve this goal, the learning strategy used is discussion and practice both manually and with a computer program package

PROGRAM LEARNING OUTCOME

PLO-4 Able to apply science and mathematics to support the understanding of statistical methods.
PLO-5 Able to apply statistical theory to statistical methods.
PLO-8 Able to use modern computing devices to solve statistical problems

COURSE LEARNING OUTCOME

CLO.1 Able to master the concepts of vectors, basic matrix operations, determinants, inverses, vectors and random matrix, systems of linear equations, vector spaces, values and eigenvectors, and their application to statistical models
CLO.2 Be able to formulate Vector problems, Basic Matrix Operations, Determinants, Inverses, Random Matrix Vectors, Systems of Linear Equations, Vector Spaces, Eigenvalues and Vectors and their application to statistical models
CLO.3 Able to solve problems related to matrix differential, matrix factorization, and matrix norm.
CLO.4 Able to choose methods in solving Linear Equation Systems related to Inverse Moore Penrose, Inverse Generalization and Least Square Inverse
CLO.5 Be able to choose a special matrix and its operations as well as the shape of the quadratic distribution

MAIN SUBJECT

1. Vectors and matrix
2. Determinants and Inverses
3. Vector Random and its applications
4. Vector Space
5. Eigenvalueas, Eigenvectors, and Diagonalization

6. Decomposition Matrix and Norm Matrix
7. Generalized Invers
8. Differential scalar functions, function vectors, and function matrices, and their applications.
9. Matrix And Special Matrix Operations

PREREQUISITE

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REFERENCES

1. Anton, H., & Rorres, C. (2013). Elementary linear algebra: applications version. John Wiley & Sons.
2. Basilevsky, A. (2013). Applied matrix algebra in the statistical sciences. Courier Corporation.
3. Schott, J. R. (2016). Matrix analysis for statistics. John Wiley & Sons.
4. Searle, S. R., & Gruber, M. H. (2016). Linear models. John Wiley & Sons.